

SALT LAKE VALLEY

By K.K. Johnson

Salt Lake Valley covers about 400 square miles in the lowlands of Salt Lake County. Ground water occurs in unconsolidated deposits in the valley under water-table and artesian conditions. Recharge to the aquifers is from the mountains that border the valley. In the southern two-thirds of the western half of the valley, ground water moves from the base of the Oquirrh Mountains eastward toward the Jordan River; in the northern one-third of the western half of the valley, the direction of movement is mostly toward Great Salt Lake. In the eastern half of the valley, ground water moves westward from the base of the Wasatch Range toward the Jordan River. The Jordan River drains both surface water and ground water from the valley.

Total estimated withdrawal of water from wells in Salt Lake Valley in 1998 was about 122,000 acre-feet, which is 1,000 acre-feet less than in 1997 and about 16,000 acre-feet less than the average annual withdrawal for 1988-97 (tables 2 and 3). Withdrawal for public supply was about 77,900 acre-feet, which is 1,400 acre-feet more than was reported in 1997. Withdrawal for industrial use was about 19,500 acre-feet, which is 2,500 acre-feet less than was reported for 1997.

The location of wells in Salt Lake Valley in which the water level was measured during February 1999 is shown in figure 8. Estimated population of Salt Lake County, total annual withdrawal from wells, annual withdrawal for public supply, and average annual precipitation at the Salt Lake City Weather Service Office (WSO) (International Airport) are shown in figure 9.

Precipitation at the Salt Lake City WSO during 1998 was 23.81 inches, 8.49 inches more than the average annual precipitation for 1931-98.

The relation of the water level in selected wells completed in the principal aquifer to cumulative departure from average annual precipitation at Silver Lake near Brighton, and the relation of the water level in well (D-1-1)7abd-6 to concentration of chloride and dissolved solids in water from the well are shown in figure 10. Precipitation at Silver Lake near Brighton was 49.81 inches in 1998, which is 6.93 inches more than the average annual precipitation for 1931-98 and 7.09 inches more than in 1997. The water level in 5 of 14 selected observation wells in the principal aquifer of the Salt Lake Valley was lower in February 1999 than it was in February 1998; the water level in 8 wells was higher; and the water level in 1 well showed no change. The water level in most of the observation wells was highest during 1985-87, which corresponds to a period of much-greater-than-average precipitation during 1982-86. The water level in most of the observation wells was lowest during 1990-93, which corresponds to a drier period during 1987-92.

Water levels in observation wells in the southeastern part of the valley show long-term effects from large withdrawals. The water level in well (C-2-1)24adc-1 has declined about 24 feet since 1940, although in February 1999 it was 4.6 feet above its all-time low in 1992.

The chloride concentration from well (D-1-1)7abd-6 (located in Artesian Well Park in Salt Lake City) was 140 milligrams per liter in July 1998; this is the highest measured concentration for this well on record. The chloride concentration has continued to increase since the 1960s.

EXPLANATION

 Approximate boundary of basin-fill deposits

● Observation well

3● Observation well with corresponding hydrograph—Number refers to hydrograph in figure 10

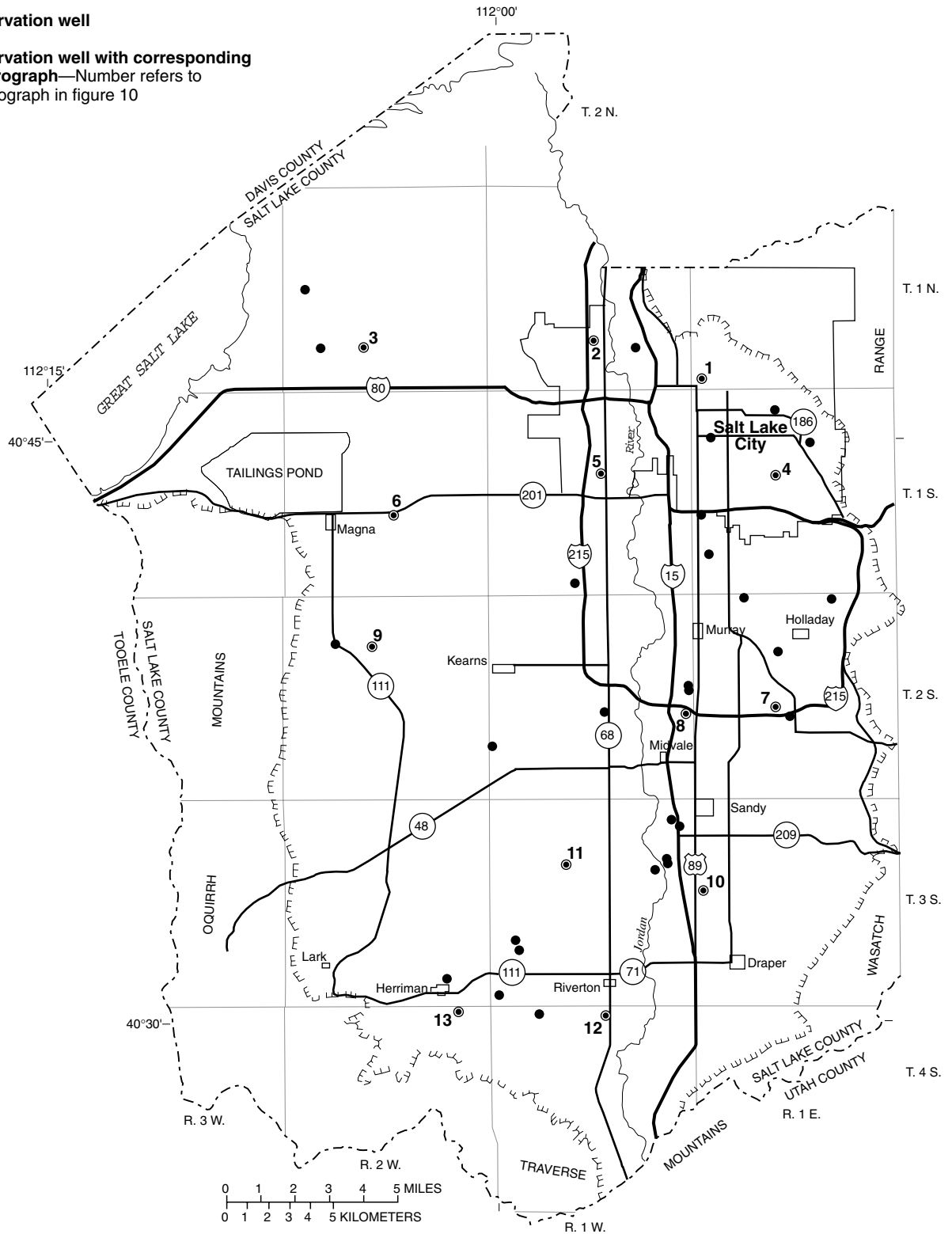


Figure 8. Location of wells in Salt Lake Valley in which the water level was measured during February 1999.

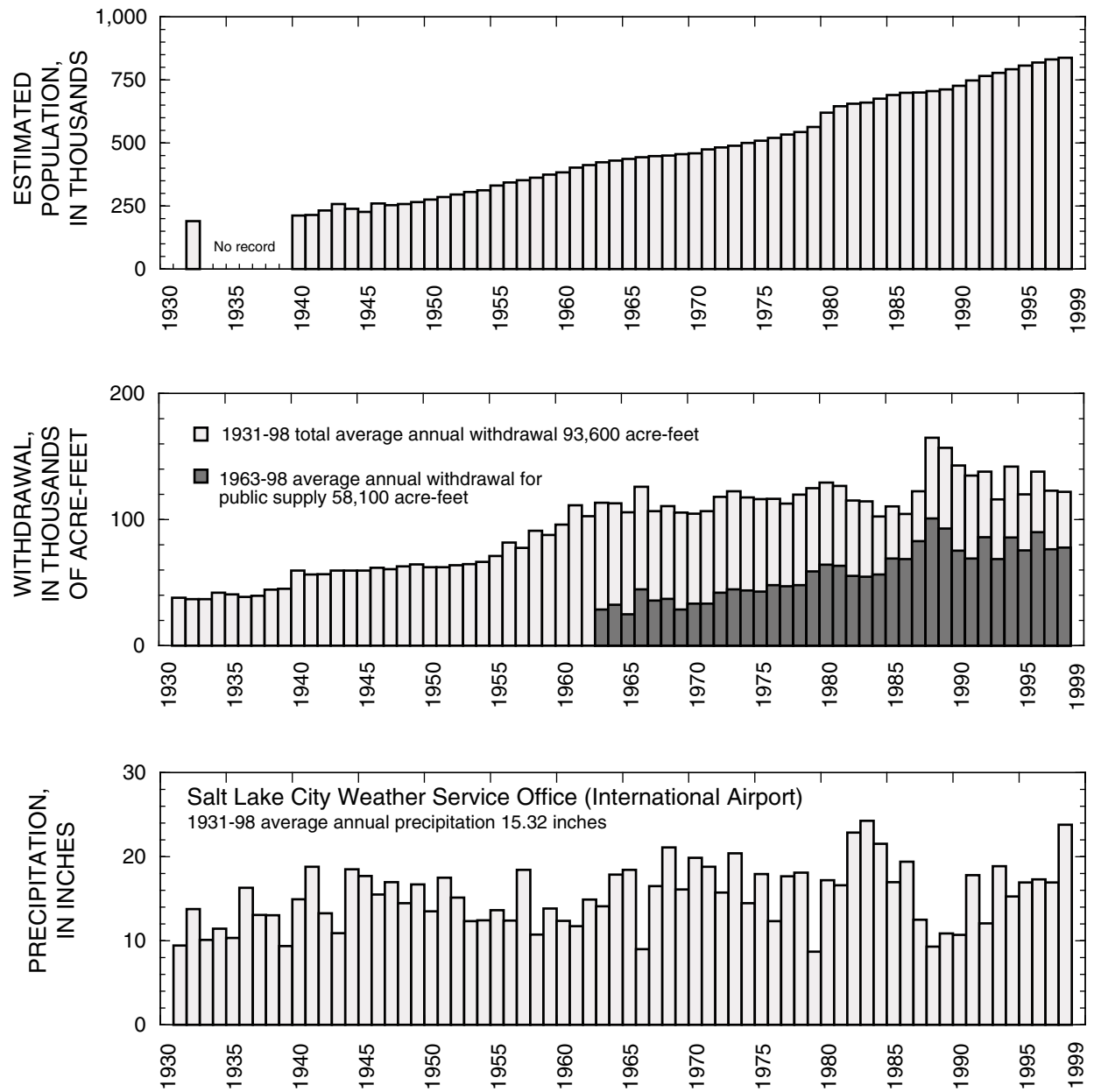


Figure 9. Estimated population of Salt Lake County, total annual withdrawal from wells, annual withdrawal for public supply, and average annual precipitation at Salt Lake City Weather Service Office (International Airport).

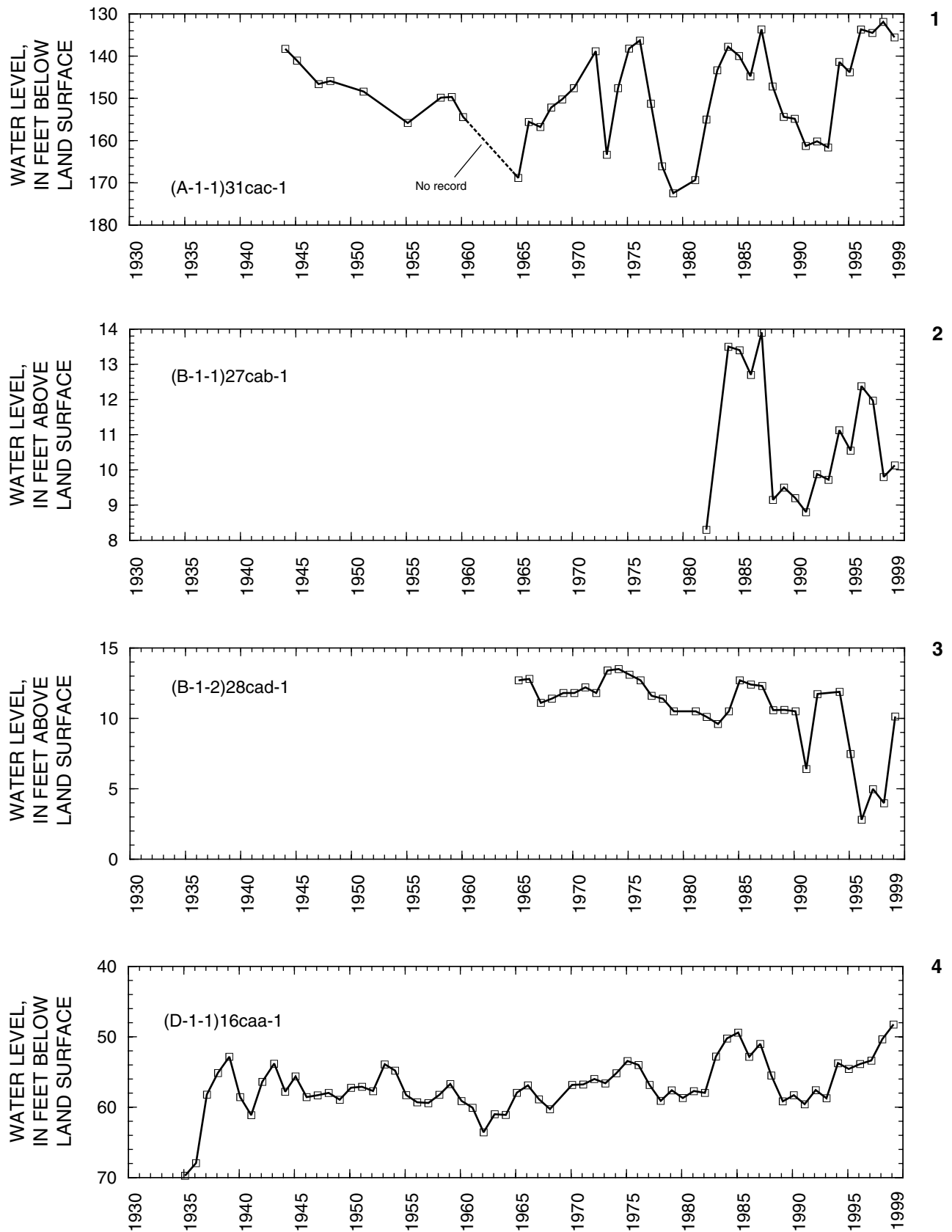


Figure 10. Relation of water level in selected wells completed in the principal aquifer in Salt Lake Valley to cumulative departure from average annual precipitation at Silver Lake near Brighton, and relation of water level in well (D-1-1)7abd-6 to concentration of chloride and dissolved solids in water from the well.

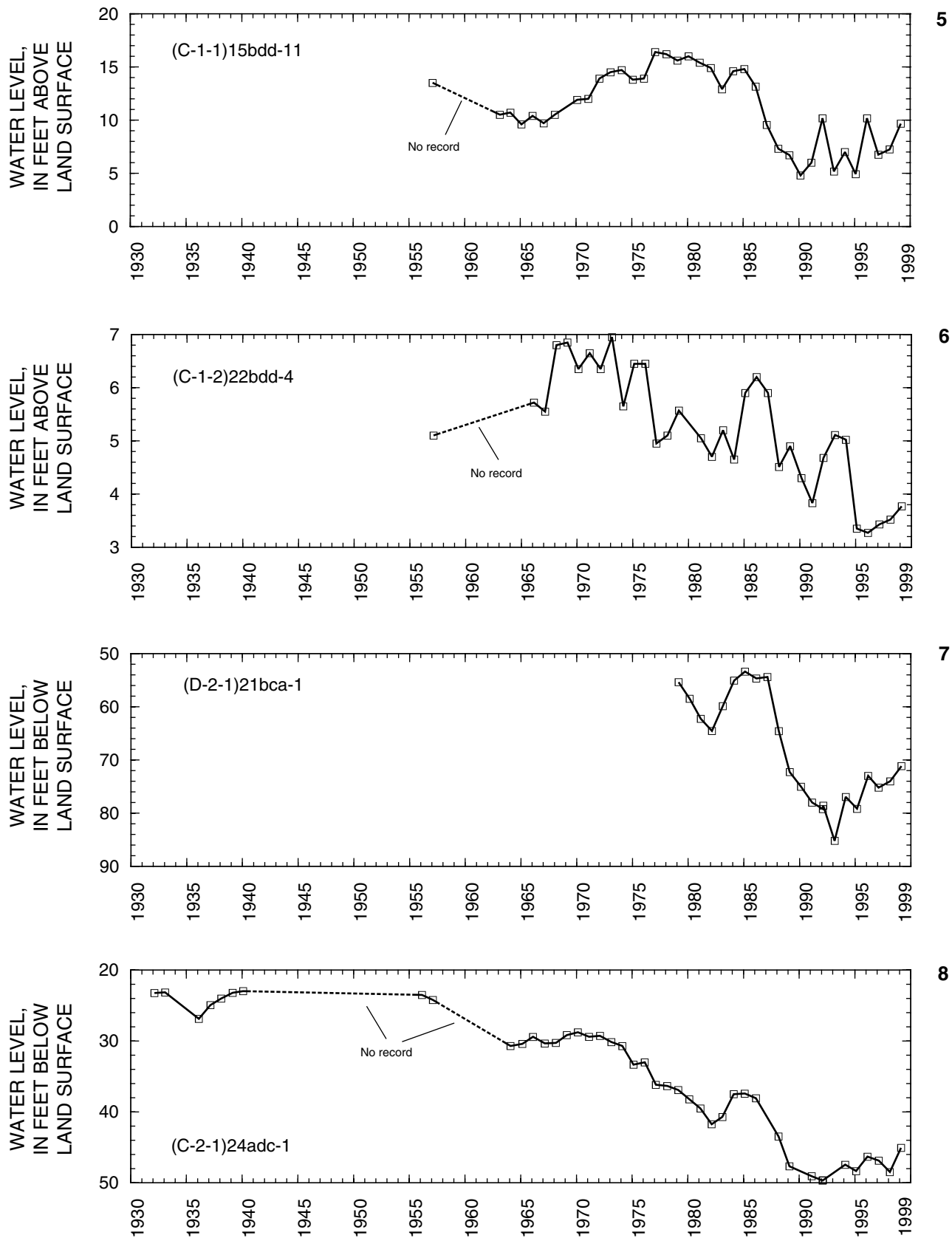


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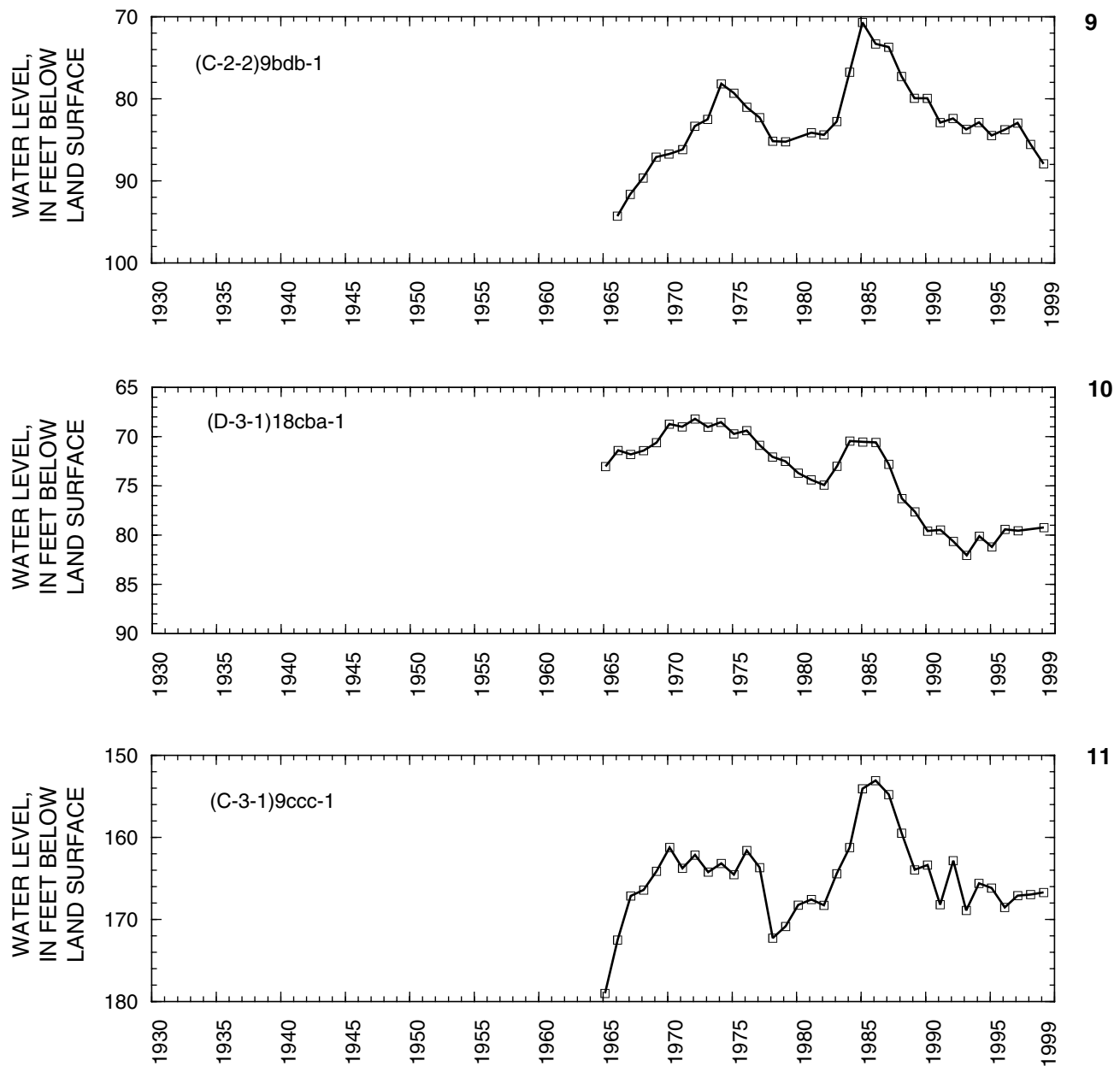


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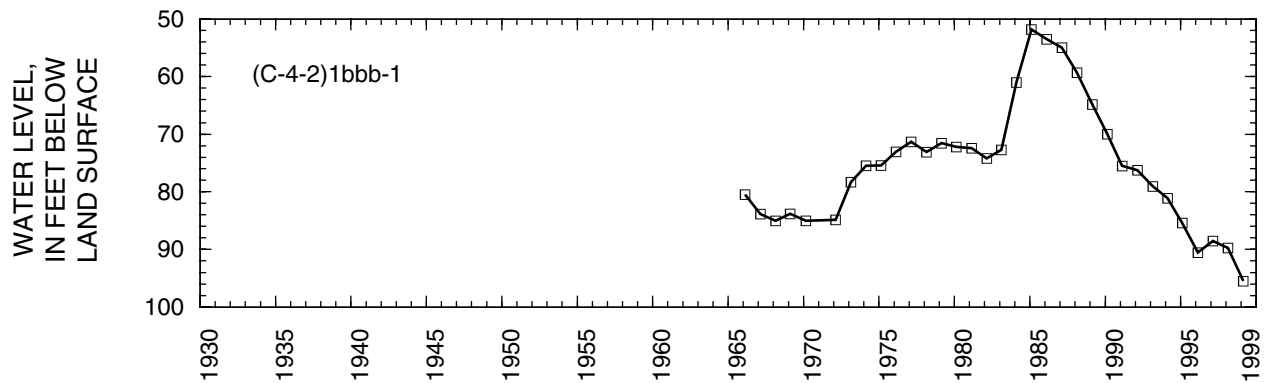
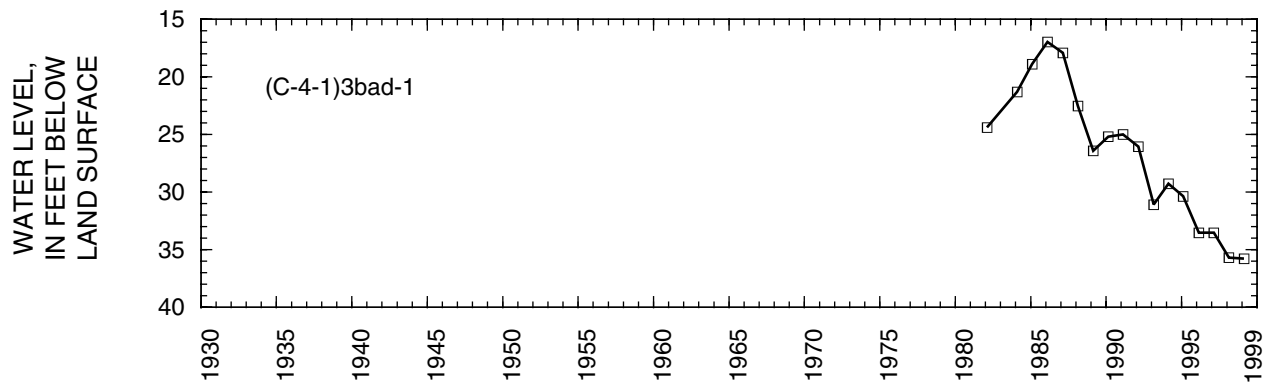


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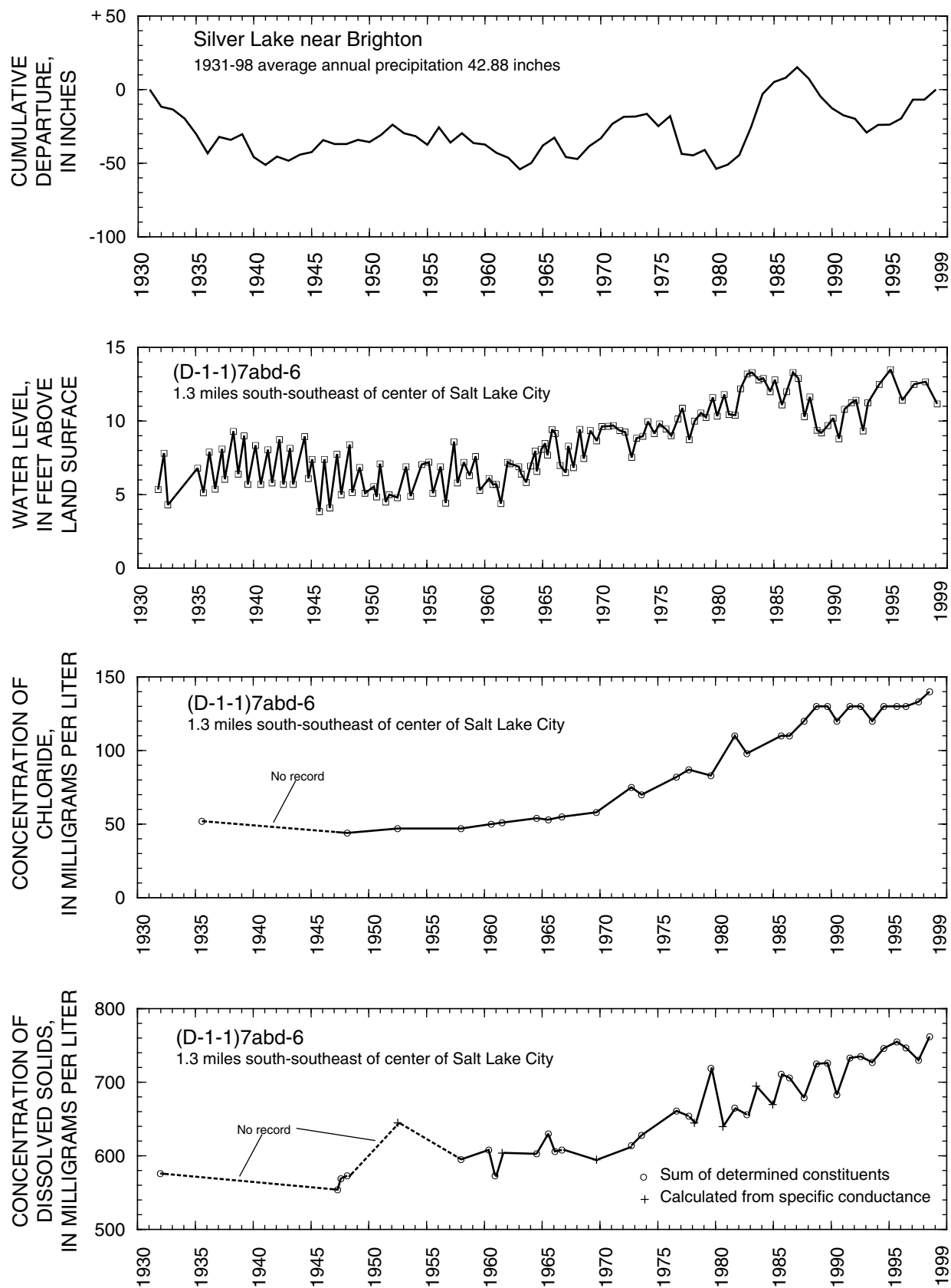


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